AG Contract No KR03-0093TRN
ADOT ECS File No JPA 02-154
Project No R052413P
Section: Arizona State University
Tests for Hot Mix Asphalt

INTERGOVERNMENTAL AGREEMENT

BETWEEN
THE STATE OF ARIZONA
AND
ARIZONA STATE UNIVERSITY

THIS AGREEMENT is entered into 04 April, 2003, pursuant to Arizona Revised Statutes, Sections 11-951 through 11-954, as amended, between the STATE OF ARIZONA, acting by and through its DEPARTMENT OF TRANSPORTATION (the "State") and the ARIZONA BOARD OF REGENTS, acting for and on behalf of ARIZONA STATE UNIVERSITY, (the "University")

I. RECITALS

1. The State is empowered by Arizona Revised Statutes Section 28-401 to enter into this agreement and has delegated to the undersigned the authority to execute this agreement on behalf of the State.

2. The University is empowered by Arizona Revised Statutes Section 15-1626 to enter into this agreement and has authorized the undersigned to execute this agreement on behalf of the University

3. The State and the University desire to participate in the research of SPT Characterization of ADOT AC Mixtures on I-10 (SPS-9 04B900) Test Sections by Arizona State University, at an estimated cost of $50,000 00, hereinafter referred to as the Project, for the safety and benefit of the traveling public. The parties hereto agree the University shall be the lead agency for the Project

THEREFORE, in consideration of the mutual covenants expressed herein, it is agreed as follows:

NO. 25948
Filed with the Secretary of State
Date Filed: 04/04/03
Janice K. Brewer
Secretary of State
By: Dina D. Fraenewald

II. SCOPE OF WORK

1. The University will:

a. Conduct appropriate Gmm tests on each asphalt mixture. Prepare final reports and submit them to ADOT's Transportation Research Center. Incorporate or resolve ADOT review comments.

b. Be responsible for the cost of the Project, in an amount estimated at $50,000.00, and for its proportionate share of any cost increases, and for any claims for extra compensation due to delays or whatever reason attributable to the University.

c. Appoint a Project coordinator at the University (ASU) to interface with ADOT relating to the research and development.

d. Accomplish the research and development in accordance with Exhibit A, which is attached hereto and made a part hereof, including an ongoing NCHRP 9-19 project, Simple Performance Test. This testing will characterize these mixtures so that the results can be used as inputs in the new AASHTO 2002 design guide. A final report documenting the program, data derived, and the final reports will be prepared and submitted. Such reports will be in a format compliant with ADOT's "Guidelines for Preparing Research Reports". Incorporate or resolve ADOT review comments.

e. No more often than monthly, invoice ADOT in the form of Exhibit B attached hereto, supported by narrative reports and an accounting of monthly costs and expenditures on the Project. Upon completion of the Project, provide ADOT with a detailed final report.

2. The State will:

a. Provide available quantities of plant mix to have Simple Performance Tests conducted on each section mix. Incorporate or resolve University review comments.

b. Be responsible for the cost of the Project, in an amount estimated at $50,000.00 and for its proportionate share of any cost increases, and for any University claims for extra compensation due to delays or whatever reason attributable to the State.

c. Reimburse the University for the cost of the project, in an amount estimated at $50,000.00, within 30 days after receipt and approval of an invoice.

d. Appoint a Project coordinator within ADOT's Transportation Technology Group to interface with the University relating to the research and development.

e. Provide available quantities of plant mix to have Simple Performance Tests conducted on each section mix. Incorporate or resolve University review comments.

f. Reimburse the University within 30 days after receipt and approval of monthly invoices, in a total amount estimated at $50,000.00

III. MISCELLANEOUS PROVISIONS

1. This agreement shall become effective upon filing with the Secretary of State.

2. This agreement shall remain in force and effect until completion of said project and reimbursements; provided, however, that this agreement, except any provisions for maintenance and electrical energy, which shall be perpetual, may be cancelled at any time prior to the award of a Project construction contract, upon thirty (30) days written notice to the other party.

3. This agreement may be cancelled in accordance with Arizona Revised Statutes Section 38-511.

4. The provisions of Arizona Revised Statutes Section 35-214 are applicable to this contract.

5. In the event of any controversy, which may arise out of this agreement, the parties hereto agree to abide by required arbitration as is set forth for public works contracts in Arizona Revised Statutes Section 12-1518.

6. All notices or demands upon any party to this agreement shall be in writing and shall be delivered in person or sent by mail addressed as follows:

Arizona Department of Transportation
Joint Project Administration
205 South 17 Avenue, Mail Drop 616E
Phoenix, AZ 85007
FAX (602-712-7424

Karina Lugo, Sponsored Projects Officer
Office for Research & Sponsored Projects Admin.
Arizona State University
PO Box 873503
Tempe, AZ 85287-3503

Copy To: Dr. M.W. Witczak, Professor
Department of Civil & Environmental Engineering

Fax: (480) 965-0649

7. Attached hereto and incorporated herein is the written determination of each party's legal counsel that the parties are authorized under the laws of this state to enter into this agreement and that the agreement is in proper form.

IN WITNESS WHEREOF, the parties have executed this agreement the day and year first above written.

ARIZONA BOARD OF REGENTS
FOR AND ON BEHALF OF
ARIZONA STATE UNIVERSITY

By _____ 2/27/03
RANDALL DRAPER
Director, Research Administration

STATE OF ARIZONA
Department of Transportation

By _____ 3/2
DALE BUSKIRK, Acting Director
Transportation Planning Division

ASU'S PRINCIPAL INVESTIGATOR APPROVAL
I have reviewed the terms of this contract and they are acceptable to me. I request that an authorized signatory execute this contract on behalf of the university.

_____ 7 February 2003
Dr. Matthew Witczak Date

APPROVED

_____
Assistant Attorney General
Attorney for Department
of Transportation

Date 3-27-03

G: 02-154-ARTC/ASU-AC Mixtures
13Jan2003

EXHIBIT A

ASU ADOT
Inter Governmental Agreement Proposal
Prepared by Dr.M.W.Witczak, ASU
20 August 2002

New Research Project (ASU-ADOT)

"SPT Characterization of ADOT AC Mixtures on I-10 (SPS-9 04B900) Test Sections"

Research Performance Period

It is anticipated that this research study will be initiated 1 September 2002 and the final project report presented to ADOT no later than 31 May 2003 (9 month duration).

Project Study Cost

The estimated project cost is $50,000. ASU will invoice ADOT on a monthly basis for work accomplished during the billing period.

Project Coordination

All project correspondence and coordination will be handled between Dr. M.W.Witczak (Professor, Department of Civil and Environmental Engineering, ASU) and Mr. Larry Scofield (ADOT- Arizona Transportation Research Center)

Background

In the mid 1990's, ADOT designed and constructed a series of test sections on I-10 (MP 122.29 to MP 112.81). This test section , on the westbound lanes of I-10 was designated as a "Long Term Pavement Performance (LTPP)" Special Project Section and given the national database designation as Arizona SPS-9 04B 900.

Because performance and traffic data for the test sections are still being continuously monitored, the site offers a very unique opportunity to have ASU also characterize the Simple Performance Test responses for AC mixtures used in the SPS sections. This would serve the dual purpose of providing valuable information to ADOT regarding material responses for use in the 2002 Design Guide implementation but also for the ongoing NCHRP 9-19 project dealing with the development of the Simple Performance Test.

In this new ADOT study, six (6) different AC materials Mixtures have been selected for lab evaluation. They are:

ARAC	04B964	Sta 5945+00 / Sta 5959+00
SMA Polymer	04B960	Sta 6361+00 / Sta 6366+00
SMA Cellulose	04B961	Sta 6308+00 / Sta 6313+00
SP Level 1 (AC-40)	04B903	Sta 6256+00 / Sta 6261+00
SP Level 1 (PG76-10)	04B902	Sta 6203+00 / Sta 6208+00
SP Level III	04B962	Sta 6083+30 / Sta 6088+30

Research Program

ADOT will be responsible for furnishing ASU with available quantities of plant mix to have Simple Performance Tests conducted on each section mix. All specimens will be evaluated from 4" diameter by 6" high samples. The specimens will be cored from 6" diameter by 6" high gyratory compacted plugs. In addition, specimen ends will be sawn to provide as parallel ends as possible.

ASU will conduct appropriate Gmm (maximum theoretical density) tests on each mixture and use this information , along with air voids information, determined from both the Corelok and Bulk SSD test measurements. This will be done to insure that all ASU made specimens conform to +/- 0.5% air voids from the initial target as constructed air voids achieved in the field during construction of the test sections.

The SPT tests performed by ASU will be conducted in a priority sequence and will depend upon the amount of material (plant mix) furnished by ADOT to ASU. The sequence of the SPT priority tests will be as follows:

Complex Modulus (E*): A full master curve will be developed for each test section material. Two specimen replicates will be used. Factorial test combinations of temperature (14, 40, 70, 100 and 140 deg F) will be used at load frequencies of (0.1, 0.5, 1.0, 5.0, 10.0, and 25 Hz). Statistical curve fitting techniques will be accomplished to mathematically model the master curve. This will be accomplished so that these results will be compatible for use as input files for future use by ADOT in the AASHTO 2002 Design Guide as well as to implement the 2002 Design Guide for Arizona conditions.

Flow Time / Flow Repetitions: Depending upon the amount of available material remaining after the Complex Modulus (E*) tests have been completed; Flow characterization of each material in creep (Flow Time – Ft test) and repeated load (Flow Repetition- Fn) will be conducted. A minimum of two specimen replicates will be conducted at 130 deg F. If sufficient material still remains, a second temperature (at 100 deg F) will then be used in the evaluation. Results of the test section Ft and Fn values will be placed in the national and Arizona database for SPT results for

future implementation into the 2002 Design Guide and Superpave Mix Design methodology.

When all of the SPT tests are completed, ignition oven tests will be performed to measure the AC% of each specimen (test section) mixture. This will be conducted as a final QA/QC check to insure that the typical AC% values found for the specimens are in general agreement with typical historic construction records for the test site.

Upon completion of the ASU testing program, a final report detailing the results of the study will be developed and forwarded to ADOT for their review and approval.

Section Information Required:

Certain minimum levels of information will be needed, by the ASU research team, for completion of this study. ASU personnel will assist, in any manner deemed necessary by ADOT, to collect and synthesize test section information. However, ADOT (with ASU assistance) will be responsible for collecting the following information and providing it to ASU.

- Field Construction Reports (Test Sections)
  - Mix Design
  - Material Properties (AC-Aggregate)
  - Plant Records (AC%, Gradation etc)
  - Field Compaction (In-situ air voids)
- Traffic History (by Lane and Test section)
- Pavement Cross Section Data
  - Layer Types
  - Layer Thicknesses
  - Layer Response Properties
  - GWT / Bedrock Depths (if appropriate)
- Performance Date
  - Distress – Time History
    - Rutting (by layer if appropriate / possible)
    - Alligator Cracking
    - Longitudinal Wheel Path Cracking
    - Transverse Cracking
    - Other Major Modes Present

ASU ADOT
Inter Governmental Agreement Proposal Budget

New Research Project (ASU-ADOT) "SPT Characterization of ADOT AC Mixtures on I-10 (SPS-9 04B900) Test Sections"

Costs per AC Mix Material Evaluated

Lab Technician Tasks
- Collect / Organize Material
- Run Wmass – Va% Curves
- Prepare Specs to Site Va%
- Core-Trim Specimens
- Run Corelok Va%
- Run SSD Va%
- Run Ignition Oven %

Burdened Labor Costs:	$2133.72
ASU Overhead (50%)	$1066.86
AC Material Subtotal:	$3200.58

GRA / Professional Staff Tasks
- Collect / Synthesize Field Site Data
- Conduct SPT Tests (2 replicates)
  - E*, Ft and Fn
- Analysis of Test Results
- Develop Final Report

Burdened Labor Costs:	$3171.85
ASU Overhead (50%)	$1585.93
AC Material Subtotal:	$4757.78

Expendable Laboratory Equipment Supplies

Costs per Material:	$250.00
ASU Overhead (50%):	$125.00
AC Material Subtotal:	$375.00

Project Summary

Costs per AC Material Evaluated:

Item	Direct Cost	ASU Overhead	Subtotal
Lab Technician Tasks	$2133.72	$1066.86	$3200.58
GRA / Prof Staff Tasks	$3171.85	$1585.93	$4757.78
Exp Lab Supplies	$250.00	$125.00	$375.00
	$5555.57	$2777.79	$8333.36

Project Study Costs (6 Materials Evaluated):

Item	Direct Cost	ASU Overhead	Subtotal
Lab Technician Tasks	$12802.30	$6401.10	$19203.40
GRA / Prof Staff Tasks	$19031.10	$9515.50	$28546.60
Exp Lab Supplies	$1500.00	$750.00	$2250.00
	$33333.40	$16666.60	$50000.00

Total Project Cost: $50000.00